



SLOVENSKI STANDARD
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Household and similar electrical appliances - Safety -- Part 2-90: Particular requirements for commercial microwave ovens

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke -- Teil 2-90: Besondere Anforderungen für gewerbliche Mikrowellenkochgeräte

Appareils électrodomestiques et analogues - Sécurité -- Partie 2-90: Règles particulières pour les fours micro-ondes à usage commercial

Ta slovenski standard je istoveten z: EN 60335-2-90:2002/prAA

ICS:

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61B/283/CDV

**COMMITTEE DRAFT FOR VOTE (CDV)
PROJET DE COMITÉ POUR VOTE (CDV)**

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Secretary: Sat Mohan-Ram Secrétaire:			
Also of interest to the following committees Intéresse également les comités suivants TC27 MT23		Supersedes document Remplace le document 61B/271/CD and 61B/276/CC	
Functions concerned Fonctions concernées			
<input checked="" type="checkbox"/> Safety Sécurité	<input type="checkbox"/> EMC CEM	<input type="checkbox"/> Environment Environnement	<input type="checkbox"/> Quality assurance Assurance qualité

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Titre : CEI 60335-2-90-A2f2 Ed 2.0: Sécurité - Partie 2-90: Règles particulières pour les fours à micro-ondes à usage commercial - Fours à micro-ondes sans porte ou similaire et avec dispositifs de transport (Annexe BB)

Title : IEC 60335-2-90-A2-f2 Ed 2.0: Safety - Part 2-90: Particular requirements for commercial microwave ovens - Microwave ovens without a door or similar and with transportation means (Annex BB)

Note d'introduction

Introductory note

ATTENTION	ATTENTION
CDV soumis en parallèle au vote (CEI) et à l'enquête (CENELEC)	Parallel IEC CDV/CENELEC Enquiry

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-90: Particular requirements for commercial microwave ovens

1. Scope

Addition

This international standard also applies to **microwave ovens without a cavity door and with transportation means** that are intended for commercial use only, for the heating of food and beverages.

NOTE The particular requirements for these appliances are contained in Annex BB.

Microwave ovens, covered by annex BB, have **transportation means** for moving the **microwave load** through the **microwave oven**. Requirements for tunnel microwave ovens and several types of microwave vending machines are covered.

NOTE In annex BB a **microwave oven without a cavity door and with transportation means** is described as a **microwave oven**. All clauses of this standard apply to these appliances unless otherwise specified in Annex BB.

This international standard also takes into account **ordinary persons** having access to the **removing area** of the vending machine.

This international standard does not take into account the use of a **microwave oven without a cavity door and with transportation means** by **ordinary persons** except in the vicinity of **entrance and exit ports**.

NOTE 101 The rationales for particular microwave exposure conditions and measures related to microwave energy being confined by an open structure are in Annex BB.

NOTE 102 In some countries, additional requirements to BB 22.119.1 are specified by national authorities responsible for the protection of labour and similar authorities.

Modification:

Delete the 2nd paragraph of Note 105.

2 Normative references

This clause of Part 1 is applicable.

3 Definitions

NOTE For more details see figure 103

Addition

3.108

instructed person

person who is sufficiently instructed and monitored to know how to avoid any danger caused by the operation of **microwave ovens**

3.109**skilled person**

person with suitable professional education, knowledge and experience to discern and to avoid any danger caused by the operation of **microwave ovens**

3.110**ordinary person**

person who is neither a skilled person nor an instructed person

3.111**transportation means**

means to transport the **microwave load** through the microwave oven

NOTE An example of a **transportation means** is a belt, an arm or an inclined plane.

3.112**load**

food and beverages that can be heated up in a **microwave oven**

3.113**microwave enclosure**

structure that is intended to confine microwave energy to a defined region

NOTE 1 Barriers mounted outside the microwave enclosure are not considered a part of the microwave enclosure.

NOTE 2 A microwave enclosure may consist of a cavity, quarter wave chokes (acting by impedance transformation), mode chokes (acting by field pattern mismatching) and microwave energy absorbers.

3.114**microwave barrier**

physical barrier which is microwave transparent, limiting access to the **microwave enclosure**, mounted outside the **microwave enclosure** and can only be removed with the aid of tools

NOTE 1 A **microwave barrier** may be mounted between the **microwave enclosure** and the external cover of the appliance.

NOTE 2 Devices such as an array of metal chains or hinged metal plates at entrance and exit ports intended to reduce microwave leakage are not considered **microwave barriers**.

NOTE 3 Construction requirements are in clause 22.119.

3.115**entrance and exit ports**

openings in the **microwave enclosure** through which **microwave loads** move

3.116**loading area**

area on which the **microwave load** is placed

3.117**means of monitored microwave interlock**

means of microwave interlock that incorporates a supervision device

3.118**protective blocking structure**

movable mechanical structure located in the removing area limiting access to the **microwave enclosure**

3.119**removing area**

area from which the **microwave load** is removed

60335-2-90/Amend 2/f2/Ed2.0/CDV© IEC 4

3.120

viewing opening

opening in the **cavity** through which the warm up process can be visually monitored

3.121

fixed means of connection

all parts of the microwave enclosure that are permanently open with the exception of entrance and exit ports and viewing openings

NOTE Fixed means of connection may be used for venting and water flushing.

3.122

detachable means of access

all parts of the **microwave enclosure** that can be opened or removed without the aid of tools to get access to the inside for maintenance, with the exception of **entrance and exit ports** and **viewing openings**

NOTE Examples of detachable means of access are tunnels that are opened by drop down or sliding action and cavity lamp covers.

3.123

means of microwave interlock

mechanical or electrical safety devices or systems that operate when certain conditions are not fulfilled (e.g. an **interlock** system that prevents the operation of the **microwave generator** when a **means of access** is open)

3.124

maintenance cover

structural feature of any part of the equipment that can be opened or removed by the use of a tool to provide access for routine maintenance, service, replacement of expendable parts etc. in microwave containing areas

3.125

cleaning cover

part of the microwave enclosure that can be opened or removed, only with the aid of a tool, for frequent cleaning purposes, during operation

3.126

reference surface

surface in the vicinity of entrance and exits ports defined depending on the reading of microwave leakage of BB 32

NOTE 1 If the leakage reading is less or equal 50 W/m^2 , the reference surface is the surface of the geometric opening of the **microwave enclosure** without **microwave barrier**.

NOTE 2 If the leakage reading exceeds 50 W/m^2 , the reference surface is an artificial surface located 50 mm away from the locations where the sensor of the instrument measures leakage readings of 50 W/m^2 straight inwards towards the appliance.

NOTE 3 For further explanation refer to last issue of BB 32.

60335-2-90/Amend 2/f2/Ed2.0/CDV© IEC 5

Bibliography

Addition

IEC 61270-1: Capacitors for microwave ovens

ANNEX BB

(normative)

Requirements for commercial microwave ovens without a cavity door
and with conveyor-type means

BB3 Definitions

Note: For more details see figure 103

BB.3.1.9 Replacement
normal operation

The **microwave oven without a cavity door and with conveyor-type means** is operated according to the manufacturer's instructions. If no instructions are provided, the appliance is operated under the following conditions.

a) Tunnel type appliances are operated under the following conditions:

- 1) If the entrance and exit port heights are adjustable, the largest height is used
- 2) The highest generator power settings are used.

b) The load to be heated up consists of **N** cylindrical containers of borosilicate glass with a maximum thickness of 3 mm and an external diameter of approximately 190mm, filled with (1000 g ± 50 g) potable water having an initial temperature of (20 ± 2) °C. These containers are placed so that all containers are inside the **cavity** and as many as possible **microwave generators** are operating at the same time.

The number **N** results from the following formula:

$$N = P / 1100 \text{ W} \quad (P = \text{rated microwave power output [W]})$$

The result of **N** shall be rounded off to the nearest integer.

If is not possible to use of these containers, containers of the same material and thickness and with a water mass of not less than 275 g ± 15 g shall be used.

An excess number of containers are prepared, so that the whole length and width of the **transportation means** inside the **microwave enclosure** is loaded.

The conveyor speed is set to the lowest reasonable value that will not bring the loads to boiling.

Loads are taken out and are replaced with new cold loads on the **loading area** as they come out on the **removing area**.

c) Single special load vending type appliances are operated with their intended load. Other vending type appliances are operated under the following conditions:

i) Sealed plastic bags with potable water are used, with a water mass corresponding to the weight of typical **microwave loads** for which the appliance is intended.

The appliance is operated for consecutive cycles, the duration of each cycle is determined by the following formula:

$$t = m * 4,187 * \Delta T / P$$

where **t** is the duration of each cycle [s], **m** is the mass of the water [g], **ΔT** is the required temperature rise of 55 K and **P** is the rated microwave power output [W]. The initial temperature should be 20 °C ± 5 °C.

ii) New loads are supplied with the shortest possible pauses between runs.

NOTE Care should be taken when handling the load.

60335-2-90/Amend 2/f2/Ed2.0/CDV© IEC 7

BB.3.103 Replacement cavity

space within the microwave enclosure where the microwave load is heated with high microwave energy

NOTE Waveguides between the microwave generator and cavity are included since they also contain high microwave energy

BB.7 Marking and instructions**BB.7.1 Addition**

- Water pressure or pressure areas in kilopascal (kPa) for the appliances that are determined for the connection to the water supply, or is fixed in the instructions for use

Modification to the 5th line of Part 1:

- model or type reference and serial number of the appliance. If the generator(s) is separate from the cavity part of the appliance, this information shall also appear on the generator(s).

BB.7.12 Addition

- details for necessary cleaning required for hygienic reasons (e.g. **cavity, transportation means**) and also for functional reasons (e.g. **means of microwave interlock, sensor**).
- information necessary for dispatch, positioning, installation and operation, including details of weight, dimensions and required minimum distances.

Modification to the 9th indent

- if smoke is observed, follow the instructions supplied by the manufacturer in order to contain the fire;

BB.7.101.1 Addition

A label shall be provided, together with instructions for fixing it in a conspicuous place close to the **exit port**. The label shall state the substance of the following if applicable.

- Warning: Microwave heating of beverages and similar can result in delayed eruptive boiling, therefore care must be taken when handling the container.
- Warning: Microwaved food and beverages can be very hot, handle with care.

Compliance is checked by inspection

BB.7.101.2 The instructions for the operator shall include the substance of the following warnings.

- WARNING: If parts of **entrance ports, exit ports, means of access, viewing openings, microwave barriers, covers, the microwave enclosure** or any other means named by the manufacturer are damaged, the appliance shall not be operated until it is repaired by a **skilled person**. Until repairs are carried out, the appliance shall be set in a permanent non-operational condition (e.g. with key switch, code-card or similar devices). Further details shall be included in the instructions for use.

- WARNING: The **microwave oven** shall only be operated by **instructed persons**. The **instructed persons** shall regularly, but at a minimum of once a year, be instructed by a **skilled person**. A record of the instruction provided shall be recorded.

BB.7.101.3 The service or repair manual shall include the substance of the following:

- WARNING: The **microwave oven** shall comply with requirements of clause 32 after every repair and according to the instructions of the manufacturer.

60335-2-90/Amend 2/f2/Ed2.0/CDV© IEC 8

Attention: Persons shall not be exposed to excessive emitted microwave energy from the **microwave generator**. All connections, waveguides, flanges, seals etc. of the **microwave enclosure** and **microwave barriers** shall be safely constructed so that the microwave leakage does not exceed the allowed limit. The operation of the appliance without a microwave absorbing load is to be avoided. The appliance shall be regularly maintained and kept in a good condition to ensure that microwave leakage does not exceed the allowed limit.

The microwave oven shall only be maintained by **skilled persons**.

The manufacturer shall supply detailed recommendations on the prevention of cavity fires together with guidance on how fires should be handled, should they occur. Guidance should also be provided on dealing with low water content foods, metal objects and containers with metal.

BB.7.12 Addition

WARNING: Do not programme excessive heating times. Overheating can result in contamination or fire.

BB.8 Protection against accessibility to live parts

BB.8.1.1 Addition

Test probe B of IEC 61032 is applied into openings of less than 75 mm that the probe will permit, to any depth and to a distance of 5 times the minor dimension of openings that are greater than 75 mm, up to a maximum of 850 mm. The probe is rotated or angled to all possible positions, during and after insertion.

BB.9 Starting of motor-operated appliances

BB.9.1 Motors that drive the transportation means shall start under all voltage conditions that may occur in use.

*Compliance is checked by starting the motor three times at a voltage equal to 0,85 times **rated voltage**, the motor being at room temperature at the beginning of the test.*

*The motor is started each time under the conditions occurring at the beginning of **normal operation** or, for automatic appliances, at the beginning of the normal cycle of operation. The motor shall be allowed to stop between successive starts. For appliances provided with motors having other than centrifugal starting switches, the test is repeated at a voltage equal to 1,06 times **rated voltage**.*

*In all cases, the motor shall start and it shall function in such a way that safety is not affected and overload **protection devices** of the motor shall not operate.*

NOTE Prior to commencing the test, appliances with **conveyor means** shall be loaded with the heaviest load as specified by the manufacturer. If no instructions are provided, the conditions of clause BB.3.1.9 apply.

BB.11 Heating

BB.11.7 Modification:

The **microwave oven** is operated as specified in BB.3.1.9 until steady conditions are established.